

# Editorial

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# Editorial

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**Biographical notes:** Pingyu Jiang is a Professor at State Key Laboratory for Manufacturing Systems Engineering at Xi'an Jiatong University, China. He received his PhD in Mechanical Engineering from Xi'an Jiaotong University, China in 1991, and he was promoted to Full Professor in 1999. He is the author and co-author of over 100 journal papers, two teaching textbooks and one monograph. His main research interests include e-manufacturing, virtual manufacturing, etc.

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Currently the business mode of manufacturing enterprises is undergoing a great change, aimed at winning much more benefits and realising new product value enhancements. In this situation, selling efficient working capabilities through intangible services attached to products, as opposed to merely selling tangible products, is becoming a new trend.

In order to enable the above business mode, we not only need to construct a kind of new product service system and design the corresponding service network so as to maintain the efficient working capabilities, but also to consider the service accessibility of products through modularisation, embedded systems, environmental consideration, etc. in design stage. In addition, applying the service-oriented manufacturing philosophy under outsourcing, JIT, zero inventory, etc. is another way to cut down the cost of tangible products. It is obvious that service activities cover the whole product life-cycle, so it is important to attain a broad understanding of the way in which service-orientation affects product, manufacturing and customer use. In the viewpoint of theory and

methodologies, there is a dependency on a combination of manufacturing/design science with service science.

On the basis of these considerations of a service-oriented development, this special issue focuses on reporting current research progresses and industrial case studies related to product service solution in the whole product life-cycle activities. We hope this feature issue would be a platform for world-wide researchers from both academic and industrial fields to exchange useful ideas. In addition, we also hope it would be an excellent attachment for the NSFC workshop on 'product service solutions in life-cycle activities' which held in Xi'an on 10–11 March, 2008 under the support of Natural Science Foundation of China (NSFC).

Originally, the topics of potential contributions may include, but not limited to:

- frameworks, models and methodologies for product service systems
- frameworks, models and methodologies for service-oriented manufacturing
- frameworks, models and methodologies for customer-oriented service systems
- design for easy service, including design for embedded systems, design for environment, design for modularisation, design for maintenance, etc.
- organisational modes for product service systems
- service design
- product life-cycle data modelling and management
- transitional strategies and experiences from product to product service system
- outsourcing of manufacturing via services
- performance analysis for service networks
- product service workflow management
- online dynamic product manual integrated with service computing
- remote product monitoring and fault diagnosis
- e-maintenance
- IP sensor networks for products
- measurement of product value enhancements through services
- planning and scheduling for product service flow
- interface design for collaboration in service activities
- environmental issue in PSS
- recycling in PSS
- industrial case studies

On the basis of the above topic guidance and paper selection/review procedure, six papers are accepted to compose this special issue.

The first paper by Rajkumar Roy and Kalyan S Cheruvu, titled 'A competitive framework for industrial product service systems', gives us a review and correspondent perspective on industrial product-service system (iPSS or $IPS^2$) in the context of business-to-business market and investment goods based industries, and also proposed a new comprehensive framework to explain a competitive $IPS^2$ with sustainable customer value as the outcome.

From the angle of iPSS users, Pingyu Jiang et al. just present a new conceptual framework about using iPSS to power a manufacturing executive system (MES) in their second paper 'A new conceptual architecture to enable iPSS as a key for service-oriented manufacturing executive systems'. To clarify its real mechanism hidden, four phenomena of running the service-oriented machining are firstly analysed and then a conceptual architecture to implement a service-oriented manufacturing system which uses the service-oriented machining is put forward.

Generally, it is very important to understand how the values increase by means of integrating services with products during life-cycle activities. So in the third paper, 'IT-supported value-added chains for the integration of products and services', Oliver Thomas et al., report a research outcome on analysing the value-added chains in the machine and plant construction industry and identifying this potential. A strategic approach linking production with service provision shows how to realise the improvement potential.

The fourth paper 'Achieving mass customisation through servicification', written by Erik Sundin et al., present a concept related to 'servicification' of products available by integrated product service engineering so as to reach the goal of mass customisation. In particular, the authors describe their case study concerning a forklift truck manufacturer called Toyota Material Handling Group (TMHG). TMHG customise their product/service offerings and by doing so they can offer its customers increased value than only selling standard forklift trucks.

Maintenance has always been considered as a service required during the middle-of-life period of a product in order to sustain its working condition and to extend its functional life. The fifth paper 'A systematic approach for predictive maintenance service design: methodology and applications', by Jay Lee et al., addresses how maintenance can be transformed from pure 'strategies' into 'a service function'. A state-of-the-art review on maintenance design is conducted, and then a methodology, tools and two applications for effect predictive maintenance service design are introduced.

In the sixth paper 'An effective and efficient method to design services: empirical study for services by an investment-machine manufacturer', Tomohiko Sakao et al., discuss some empirical results obtained from designing services at a manufacturer. What the authors want to emphasise is on the technique addressing customer value through extension of quality function deployment.

To sum up, we can say that the above six selected papers present the different aspects typically related to product service solutions in life-cycle activities. Hopefully it is useful for further theoretic studies and potential industrial applications in depth in the area of product service systems.

Finally, the editors would like to thank all the authors and peer reviewers who worked together to release this special issue.